CLAIMS

What is claimed is:

1.   A VCO control circuit operable to control the tuning range of one or more tuning circuits, the control circuit comprising:

a variable delay block having a signal input configured to receive a reference signal, a delay input configured to set the delay amount applied to the reference signal, and an output to provide the delayed reference signal, wherein two or more different delays may be applied to the reference signal;

a delay counter having an input coupled to receive the delayed reference signal and an output configured to output a delay counter output signal; and

a tuning range selector having an input coupled to receive the delay counter output signal, and an output coupled to one or more tuning circuits, the tuning range selector operable to control the tuning range of the one or more tuning circuits,

wherein, upon receiving the delay counter output signal, the output of the tuning range selector changes the tuning range of the one or more tuning circuits.

2.   The VCO control circuit of claim 1, wherein the variable delay circuit comprises a no delay setting in which the reference signal is output with no delay.

3.   The VCO control circuit of claim 1, wherein the variable delay circuit comprises a disable setting in which the output of the variable delay block is disabled.

4.   The VCO control circuit of claim 1, wherein the tuning range selector comprises a shift register.

5.   The VCO circuit of claim 4, wherein the shift register includes set lines for programmably selecting one of the plurality of tuning ranges.

6.   The VCO control circuit of claim 1, wherein the tuning range selector comprises a counter.

7.   The VCO circuit of claim 6, wherein the counter includes set lines for programmably selecting one of the plurality of tuning ranges.

8.   The VCO control circuit of claim 1, wherein the one or more tuning circuits comprise one or more VCOs, each VCO configured to provide one or more tuning ranges.

9.   The VCO control circuit of claim 1, wherein the one or more tuning circuits comprise one or more capacitors.

10.   The VCO circuit of claim 1, wherein the one or more tuning circuits comprise one or more varactor diodes.

11.   The VCO circuit of claim 1, wherein the one or more tuning circuits comprise one or more inductors.

12.   In a circuit operable to tune to frequencies over a predetermined band, each frequency being located possibly in two or more different tuning ranges and the collection of different tuning ranges making up the predetermined band, a method for selecting which of the tuning ranges to select to tune to a predefined frequency, the method comprising:

(i) associating two or more of the plurality of tuning ranges with the predefined frequency, wherein the two or more tuning ranges associated with the predefined frequency is at least one fewer tuning ranges than the total number of tuning ranges making up the predetermined band;

(ii) selecting a first of the two or more tuning ranges to tune to the predefined frequency; and

(iii) if the presently selected tuning range does not result in the circuit tuning to the predefined frequency, then repeating (ii) by selecting another of the two or more tuning ranges associated with the predefined frequency.

13.   The method of claim 12, wherein (ii) comprises selecting a first tuning range provided by a first VCO, and (iii) comprises selecting a second tuning range provided by the first VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

14.   The method of claim 12, wherein (ii) comprises selecting a tuning range provided by a first VCO, and (iii) comprises selecting a tuning range provided by a second VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

15.   The method of claim 12, wherein (i) comprises associating three or more tuning ranges with the predefined frequency,

        wherein (ii) comprises selecting a first tuning range provided by a first VCO,

        wherein (iii) comprises selecting a second tuning range also provided by the first VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency, and

        wherein repeating (ii) comprises selecting a third tuning range provided by a second VCO if selection of the second tuning range does not result in the circuit tuning to the predefined frequency.

16.   The method of claim 12, wherein (ii) comprises selecting a tuning range provided by a first arrangement of capacitors, and (iii) comprises selecting a tuning range provided by a second arrangement of capacitors if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

17.   The method of claim 12, wherein (ii) comprises selecting a tuning range provided by a first arrangement of varactor diodes, and (iii) comprises selecting a tuning range provided by a second arrangement of varactor diodes if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

18. The method of claim 12, wherein (ii) comprises selecting a tuning range provided by a first arrangement of inductors, and (iii) comprises selecting a tuning range provided by a second arrangement of inductors if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

19. The method of claim 12, wherein (ii) comprises programmably selecting one of two or more tuning ranges.

20. The method of claim 12, wherein total number of tuning ranges comprise three tuning ranges, and wherein the two or more tuning ranges comprise two tuning ranges.

21. A computer program product stored on a computer-readable medium for selecting one of a plurality of tuning ranges for tuning to a predefined frequency, the predefined frequency being located possibly in two or more different tuning ranges over which the circuit tunes, the computer program product comprising:

(i) instruction code to associate two or more of the plurality of tuning ranges with the predefined frequency, wherein the two or more tuning ranges associated with the predefined frequency is at least one fewer tuning ranges than the total number of tuning ranges making up the predetermined band;

(ii) instruction code to select a first of the two or more tuning ranges to tune to the predefined frequency; and

(iii) instruction code to repeat (ii) by selecting another of the two or more tuning ranges associated with the predefined frequency if the presently selected tuning range does not result in the circuit tuning to the predefined frequency.

22. The computer program product of claim 21, wherein (ii) comprises instruction code to select a first tuning range provided by a first VCO, and (iii) comprises instruction code to select a second tuning range provided by the first VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

23.   The computer program product of claim 21, wherein (ii) comprises instruction code to select a tuning range provided by a first VCO, and (iii) comprises instruction code to select a tuning range provided by a second VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

24.   The computer program product of claim 21, wherein (i) comprises instruction code to associate three or more tuning ranges with the predefined frequency,

wherein (ii) comprises instruction code to select a first tuning range provided by a first VCO,

wherein (iii) comprises instruction code to select a second tuning range also provided by the first VCO if selection of the first tuning range does not result in the circuit tuning to the predefined frequency, and

wherein repeating (ii) comprises instruction code to select a third tuning range provided by a second VCO if selection of the second tuning range does not result in the circuit tuning to the predefined frequency.

25.   The computer program product of claim 21, wherein (ii) comprises instruction code to select a tuning range provided by a first arrangement of capacitors, and (iii) comprises instruction code to select a tuning range provided by a second arrangement of capacitors if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

26.   The computer program product of claim 21, wherein (ii) comprises instruction code to select a tuning range provided by a first arrangement of varactor diodes, and (iii) comprises instruction code to select a tuning range provided by a second arrangement of varactor diodes if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

27.   The computer program product of claim 21, wherein (ii) comprises instruction code to select a tuning range provided by a first arrangement of inductors, and (iii) comprises instruction code to select a tuning range provided by a second arrangement of

inductors if selection of the first tuning range does not result in the circuit tuning to the predefined frequency.

28.   A VCO control circuit comprising:

variable delay means for receiving a reference signal and for applying a predefined delay to the reference signal, thereby producing a delayed reference signal;

counter means for receiving the delayed reference signal and for outputting a delay counter output signal; and

tuning range selection means coupled to one or more tuning means, the tuning means configured to provide one or more tuning ranges, the tuning range selection means for receiving the delay counter output signal, and for changing the tuning range of one or more tuning means.

29.   The VCO control circuit of claim 28, wherein the tuning range selector means comprises a shift register.

30.   The VCO circuit of claim 29, wherein the shift register includes set lines for programmably selecting one of the plurality of tuning ranges.

31.   The VCO control circuit of claim 28, wherein the tuning range selector means comprises a counter.

32.   The VCO circuit of claim 31, wherein the counter includes set lines for programmably selecting one of the plurality of tuning ranges.

33.   The VCO control circuit of claim 28, wherein the one or more tuning means comprise one or more VCOs, each VCO configured to provide one or more tuning ranges.

34.   The VCO control circuit of claim 28, wherein the one or more tuning means comprise one or more capacitors.

35.   The VCO circuit of claim 28, wherein the one or more tuning means comprises one or more varactor diodes.